

REMARKS/ARGUMENTS

Claims 1-28 are present in this application. Claims 3-28 have been withdrawn from consideration.

Claims 1 and 2 were rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,577,675 to Ishihara et al. in view of International Patent Publication WO 99/28690 to Valle et al. and Japanese Patent Publication 2000-128557 to Ogawa et al. This rejection is respectfully traversed.

The Office Action recognizes that Ishihara lacks at least the claimed ceramic disc segments containing crystalline cordierite. The Examiner contends, however, that it would have been obvious to have used cordierite-containing ceramic in the roll of Ishihara “in order to produce rolls with increase resistance” in view of Valle. Applicants note, however, that there are many substances that exhibit characteristics of excellent heat resistance, e.g., alumina, mullite, silica, zirconia, kaolin clay, sepiolite, etc. The general concept of “heat resistance,” however, does not necessarily conform to the thermal characteristics required for a disc roll. For example, a substance having a high melting point is regarded as being excellent in heat resistance. However, having a high melting point is not sufficient for the material for a disc roll. A disc roll is subjected to high temperature during when contacting a conveyed material. Once apart from the conveyed material, the temperature of the disc roll decreases drastically. Repetition of such a cycle unfavorably causes “powder breakoff” (“powder omission” as discussed in the specification). Moreover, a disc roll is often used while passing cooling water through its shaft. This causes a large difference between the temperature of the roll surface and the temperature of the inner part of the roll, thereby accelerating the powder breakoff. The powder breakoff is a

phenomenon due to a temperature difference within the entire disc roll, rather than the level of the melting point of the material used therein.

An object of the present invention is to inhibit the powder breakoff in conveying a high temperature substance exceeding 1200°C. The present invention found that it is effective for this purpose to suppress thermal expansion and contraction, in other words, to enhance spalling resistance (see, for example, page 18) and that crystalline cordierite is effective therefor.

Thus, the term “heat resistance” can involve various aspects depending on the situation. Unless attention was paid to spalling resistance, it would have been considerably hard to select crystalline cordierite among a great number of heat resisting materials. The cited references do no mention the spalling resistance at all.

Further, as described in page 18, crystalline cordierite has low reactivity. Therefore, this material is advantageous in that when a stainless steel is conveyed on the disc roll, the roll surface is little damaged by iron oxide, thereby giving a long life. The low reactivity has nothing to do with the heat resistance. Therefore, such effects could not have been expected even if the heat resistance of crystalline cordierite was known.

Applicants thus submit that the obviousness conclusion is misplaced. Reconsideration and withdrawal of the rejection are thus respectfully requested.

In view of the foregoing remarks, Applicants respectfully submits that the claims are patentable over the art of record and that the application is in condition for allowance. Should the Examiner believe that anything further is desirable in order to place the application in condition for allowance, the Examiner is invited to contact Applicants’ undersigned attorney at the telephone number listed below.

Prompt passage to issuance is earnestly solicited.

NAKAYAMA et al.
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Respectfully submitted,

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